MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2015/2016

TDB2121 – DATABASE DESIGN AND MANAGEMENT

(All sections / Groups)

1st June 2016
9:00 am – 11:00 am
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 5 pages only excluding the cover page.
2. This Question paper consists of TWO Sections A and B.
3. Attempt All questions in Section A. Attempt any TWO out of THREE questions in Section B.
4. Please write your answers in **answer booklet**. Please write the question number of each answer clearly.

SECTION A
(Attempt All questions in this Section, this section carries 30 marks)

QUESTION 1

There are four relations in the following database. Primary keys are bolded and underlined in all tables.

PRODUCT (**Pro_ID**, Pro_Name, Pro_Type, Pro_Price)
BUYER (**Buyer_ID**, Buyer_Name, Buyer_Phone)
AGENT (**Agent_ID**, Agent_Name, Agent_Phone)
RECEIPT (**ID**, Buyer_ID, Pro_ID, Agent_ID, Quantity, Amount,Date)

a) Write SQL script to create the table RECEIPT. In addition, you are required to set two constraints as below:
- Add a constraint to make sure that the value of AMOUNT cannot be more than 1000.00.
- Set the default value of QUANTITY to 1 for every insertion.

[4 marks]

b) Answer the following queries using SQL statements.

1) List the IDs and Dates of all receipts issued between '2016-01-15' AND '2016-05-20' to the buyer named Farhan. [2 marks]

2) Create a VIEW named JerView to show the IDs and names of all Agents who handles the invoices of the buyer Jeremy. [3 marks]

3) Add a new column ***Location*** as varchar (30) to the table AGENT. Next set the location of the agent 'Tan wong' to 'KL'. [2 marks]

4) Change the Agent_Phone of the agent 'Tan wong' to '01777777'. [2 marks]

5) List the name and price of the most expensive item. [2 marks]

Continued...

QUESTION 2

a) Mr. Tan, the sales manager of XXX Trading Company, recognizes that it is time to manage the vast information pool to help guide the accelerating development. He is interested in studying the growth of their sales.

SALES are considered to be Mr. Tan's key interest. He has requested you to develop a small data warehouse prototype that will enable him to study and analyze *SALES* by *time*, *product*, *outlet* and *customer*. Part of Mr. Tan's database includes the following relations.

CUSTOMER (**Cust_ID**, Name, Address)	Number of record =200
OUTLET (**OUT_ID**, Name, Address, Phone)	Number of record =16
DEPARTMENT (**Dep_ID**, Description)	Number of record =11
ORDERS (**Time_ID**, **Cust_ID**, **Dep_ID**, Total)	Number of record =322
PRODUCT (**Prod_ID**, Type, Brand, Color, Price)	Number of record =20
TIME (**Time_ID**, Year, Month, Day)	Number of record =365

[**Hint:** you may use *all* or *some* of the above relations to design the requested SALES warehouse].

The resulting fact table must include **quantity** and total **amount**.

i. Identify the appropriate fact table components (attributes). [1 mark]
ii. Sketch out the star schema diagram for this data warehouse. [6 marks]
iii. Calculate the number of rows that will exist in the fact table. [2 marks]
iv. Estimate the total size of the fact table (in bytes), assuming that each field has an average of seven bytes in length. [2 marks]

b) Define the term *Data Warehouse*. [2 marks]

c) One of the main features of multidimensional analysis is known as *slice-and-dice*. What does *slice-and-dice* refer to? Support your answer with an example.

[2 marks]

Continued...

SECTION B
(Attempt TWO questions in this Section, this section carries20 marks)

QUESTION 1

a) Database Life Cycle (DBLC) starts with database initial study and database design. Assume that you have been instructed to design a Student Subjects Registration Systems (SSRS). You are now at the stage of database analysis and requirements (DA & R). Describe the activities involved in DA & R accordingly. Please provide one example that is related to SSRS for each component in DA & R. [4 marks]

b) Based on the following business rules, identify and illustrate the main classes using Unified Modeling Language (UML) Diagram. You must list down at least two instances for each class. [6 marks]

- Each department has many employees. Each employee works at one department.
- Each employee may involve in many projects. Each project must assign to one or many employees.
- Each project has a project manager. Each project manager may handle many projects.

QUESTION 2

a) Briefly explain the difference between Homogeneous and Heterogeneous distributed database systems. [2 marks]

b) There are different levels of data and process distribution. Briefly discuss the single-site processing, single-site data (SPSD) scenario. You may support your answer with a diagram. [3 marks]

c) Why might a query in distributed database take a long time to run? [2 marks]

Continued...

d) Suppose that a company has four regional sites A,B,C and D, part of its database is showing as below.

TABLES	TABLE FRAGMENTS	LOCATION
CUSTOMERS	CUST_1	Site A
	CUST_2	Site B
	CUST_3	Site C
PRODUCTS	PROD_1	Site B
	PROD_2	Site C
VENDORS		Site A
INVOICES		Site A

Specify the minimum type(s) of operation(s) the database must support (*remote request, remote transaction, distributed transaction, or distributed request*) in order to perform the following operations at Site D : [3 marks]

1)
```
SELECT ID , Price
    FROM PRODUCTS
      WHERE Name LIKE 'pen%';
```

2)
```
BEGIN WORK;
UPDATE VENDERS
  SET Name = 'wong'
     WHERE ID= '222';
INSERT CUSTOMERS (Num, Name, Address, Bill)
     VALUES ('210', 'Tan', '123 cyberjaya', 2135);
COMMIT WORK;
```

3)
```
BEGIN WORK;
INSERT INVOICES (Num, Name, Sum, Date)
     VALUES ('210', 'Tan ', 2135, '10-AUG-2014');
UPDATE VENDERS
SET Total = Total+300
     WHERE ID= '222';
COMMIT WORK;
```

Continued...

QUESTION3

a) Explain the difference between data and information. Give TWO examples of raw data and information respectively. [3 marks]

b) Convert the following INVOICE table into XML Version 1.0 representation. Assume the file name is *InvoiceList.xml*.

Table name: INVOICE

INV_NO	LINE_NO	PROD_CODE	LINE_UNIT	LINE_PRICE
1001	1	ZZX/3245Q	1	6.79
1005	2	SRE-657UG	1	2.99
1008	1	001278-AB	1	12.95

[3 marks]

c) Some browser provides data binding of XML data to HTML documents. Write the HTML code to bind XML data obtained in (b) to an HTML table. Assume the XML data is saved as *invoicelist.xml*.

[2 marks]

d) Define the **FOUR** technical roles of database administrator.

[2 marks]

End of page.